

**REMARKS**

Amendments to claims 69, 71, and 73 are for the purpose of clarifying what Applicant regards as the claimed invention. No new matter has been added.

Applicant wishes to thank the Examiner for withdrawing the previous § 103 rejections.

**I. Claims Rejections under 35 U.S.C. 103(a) based on Salb and Ogawa**

Claims 1-7, 10-14, 17-33, 36-40, 43-47, 56-59, and 61-67 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent No. 6,923,950 (Salb) in view of U.S. Patent No. 6,278,760 (Ogawa).

Claim 1 recites creating a *contrast-enhanced volumetric composite image* using the first and the second sets of image data that are generated at respective first and second energy levels, wherein the contrast-enhanced volumetric composite image is created such that an image contrast for bone and tissue that does not contain the contrast agent is reduced. Claims 22 and 29 recite similar limitations.

Applicant certainly agrees with the Examiner that Salb does not disclose or suggest creating a contrast-enhanced volumetric composite image. This is because Salb specifically teaches a “radiographic” imaging method (column 1, lines 10-13, and column 7, lines 53-55), which does not, and cannot, create a contrast-enhanced volumetric composite image. Applicant further points out that Salb also does not disclose or suggest creating a contrast-enhanced volumetric composite image in the manner described in the claims - i.e., using first and sets of image data generated at respective first and second energy levels.

**A. The prima facie case of the § 103 rejection cannot be established because one skilled in the art would not be motivated to combine Salb and Ogawa as purported in the Office Action.**

Applicant must disagree that it would have been obvious to combine the volumetric technique of Ogawa with the method and system of Salb, as purported in the Office Action.

As an initial matter, Applicant respectfully notes that it is improper to selectively pick out one feature (i.e., the volumetric imaging) from Ogawa and combine it wholesale with the method of Salb just for the purpose of assembling a set of features in an attempt to match the claimed elements. The purported combination is clearly improper because Salb specifically teaches a radiographic imaging technique to cancel image features of soft tissue (column 29, lines 51-55).

while Ogawa specifically teaches an imaging technique to highlight soft tissue (column 5, lines 8-12). Since Salb and Ogawa are concerned with accomplishing the opposite objectives, one skilled in the art would not be motivated to combine Salb and Ogawa, nor to do so in the manner purported in the Office Action.

Also, Applicant respectfully submits that the claimed subject matter is non-obvious over Salb and Ogawa. This is because a contrast-enhanced volumetric composite image allows accurate quantitative information (e.g. X-ray absorption coefficient) to be determined for the regions enhanced by the contrast agent as described in the subject application. This is very important for accurately detecting disease (i.e. to avoiding false positive indications). In existing tomographic imaging, the noise inherent to the image formation is so large compared to the subtle difference that disease produces in tissue (i.e. the difference is buried in the noise), that the resulting volumetric image may not have sufficient sensitivity for accurately detecting diseases. Providing a contrast-enhanced volumetric composite image in the manner describe in the claims addresses the above short coming, which is not addressed in either Salb or Ogawa. Thus, the claimed subject matter is non-obvious over the cited references and their combination. That the claimed subject matter is non-obviousness is also evidenced by the fact that on one has combined contrast-enhancement, volumetric imaging, and multiple energy imaging in the manner described in the subject application, and that contrast-enhanced volumetric composite imaging is unknown but for the disclosure of the subject application.

For at least the foregoing reasons, Applicant respectfully submits that claims 1, 22, and 29, and their respective dependent claims, are allowable over Salb, Ogawa, and their combination.

B. The prima facie case of the § 103 rejection cannot be established because Salb, Ogawa, and their combination are non-enabling with respect to the claimed subject matter.

In addition, Applicant respectfully notes that Salb, Ogawa, and their combination are non-enabling with respect to the claimed subject matter. This is because the technique of Salb is specifically for two dimensional radiographic imaging that involves contrast agent. There is nothing in Salb that teaches how to implement its method using volumetric imaging. Also, there is nothing in Salb that indicates that the weight coefficients for compensating for beam hardening in the two-dimensional radiographic imaging technique (column 30, lines 29-33) would even work for volumetric imaging. On the other hand, Ogawa is specifically directed to an imaging

method that does not involve contrast. Thus, Ogawa does not teach how to implement its volumetric imaging in a method that involves contrast agent.

Notably, the contrast-enhanced radiographic imaging technique of Salb cannot be simply substituted with the volumetric imaging technique of Ogawa, as purported in the Office Action. This is because, as discussed, the volumetric imaging technique of Ogawa is specifically for highlighting soft tissue, while the radiographic imaging technique of Salb is for reducing soft tissue contrast. Also, Salb's technique involves three energy bands (column 29, line 63 to column 30, line 8), while the technique of Ogawa involves two energy levels (column 8, lines 44-45). Indeed, from the disclosures of Salb and Ogawa, it is unclear how the volumetric imaging technique of Ogawa (which is for highlighting soft tissue) would be incorporated in the imaging technique of Salb (which is for reducing soft tissue contrast), as purported in the Office Action. Thus, the purported combination of Salb and Ogawa is non-enabling with respect to the claimed subject matter. Note that in order to sustain a *prima facie* case of the § 103 rejection, the cited references must be enabling with respect to the claimed subject matter.

C. The *prima facie* case of the § 103 rejection cannot be established because Ogawa teaches away from the subject matter of the claims.

Also, Applicant notes that Ogawa specifically teaches energy subtraction image to *highlight* tissue image (column 5, lines 8-12). Thus, Ogawa clearly teaches away from reducing image contrast for tissue, as described in the claims (which describe that image contrast for tissue without contrast is *reduced*). Since a *prima facie* case of the § 103 rejection cannot be established if a reference teaches away from the claimed subject matter, Applicant respectfully submits that no proper § 103 rejection based on Ogawa can be established, and that the § 103 rejection based on Ogawa must be withdrawn for these additional reasons.

D. The *prima facie* case of the § 103 rejection cannot be established because the purported combination of Salb and Ogawa contradicts the teachings of both references, and would render the references inoperable for their intended purposes.

In addition, Applicant further notes that Salb teaches *cancelling* radiographic density of soft tissue in an image (column 29, lines 51-55), while Ogawa teaches *highlighting* soft tissue in an image (column 5, lines 8-12). Thus, the purported combination of Salb and Ogawa would contradict the respective teachings of both Salb and Ogawa, and would render the methods and systems of both Salb and Ogawa inoperable for their intended purposes. Note that in a § 103

rejection, the entirety of the references must be considered. Also, it is improper to selectively choose certain elements from different references for combination only for the purpose of meeting the claimed elements, especially if other parts of the references teach the opposite features. Since the *prima facie* case of the § 103 rejection cannot be maintained because the purported combination of Salb and Ogawa would contradict the teachings of both references, and would render both of the references inoperable for their intended purposes, Applicant respectfully requests that the § 103 rejection be withdrawn for these additional reasons.

## **II. Claims Rejections under 35 U.S.C. 103(a) based on Salb, Ogawa, and Trauernicht**

Claims 16 and 42 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Salb in view of Ogawa, and further in view of U.S. Patent No. 5,629,968 (Trauernicht).

Claim 16 recites (1) deactivating the first and the third lines of the image elements of *an imager* and activating the second and the fourth lines of the image elements while applying the radiation at the first energy level, and (2) activating the first, the second, the third, and the fourth lines of the image elements of *the imager* (i.e., the same imager) while applying the radiation at the second energy level. Claim 42 and new claim 74 recite similar limitations. Applicant agrees with the Examiner that Salb and Ogawa do not disclose the above limitations. However, Applicant respectfully submits that Trauernicht also does not disclose or suggest the above limitations, and therefore fails to make up the deficiencies present in Salb and Ogawa.

In particular, Trauernicht discloses using a beam stop 301 for absorbing unscattered radiation, while allowing scattered radiation to be detected by the receptor 112 (see figure 3). Notably, blocking radiation using the beam stop 301 does not deactivate the image elements of the receptor 112. This is because it is understood from Trauernicht that while the beam stop 301 blocks unscattered radiation, all of the image elements in the receptor 112 remain “on” and are capable of generating image signals in response to radiation impinging thereon. Thus, Trauernicht does not disclose or suggest deactivating certain lines of image elements of an imager.

Also, Applicant submits that it is improper to consider blocking (non-application) of radiation to be the same as deactivating lines of image elements. This is because the term “deactivate” indicates that the image elements are not in an activated state. Also, the claims recite both “activating” lines of image elements, and “applying radiation.” Thus, within the context of

the claims, activating lines of image elements means different things from application of radiation.

More importantly, notwithstanding the foregoing, there is nothing in Trauernicht that discloses or suggests deactivating certain lines of the receptor 112 when applying radiation at a first energy level, and activating the *same* certain lines of the receptor 112 when applying radiation at a second energy level, as described in the claims (note that in claim 16, the first and third lines of image elements are deactivated when radiation at a first energy level is being applied, and the *same* first and third lines of image elements are activated when radiation at a second energy level is being applied). Applicant respectfully submits that in order to sustain a § 103 rejection, the cited reference being relied upon for an alleged disclosure of a claimed feature must disclose the identical claimed feature as described in the claim.

For at least the foregoing reasons, Applicant respectfully submits that claims 16, 42, and 74 are allowable over Salb, Ogawa, Trauernicht, and their combination.

**CONCLUSION**

If the Examiner has any questions or comments regarding this response, please contact the undersigned at the number listed below.

To the extent that any arguments and disclaimers were presented to distinguish prior art, or for other reasons substantially related to patentability, during the prosecution of any and all parent and related application(s)/patent(s), Applicant(s) hereby explicitly retracts and rescinds any and all such arguments and disclaimers, and respectfully requests that the Examiner re-visit the prior art that such arguments and disclaimers were made to avoid.

The Commissioner is authorized to charge any fees due in connection with the filing of this document to Vista IP Law Group's Deposit Account No. 50-1105, referencing billing number **VM 03-029 US**. The Commissioner is authorized to credit any overpayment or to charge any underpayment to Vista IP Law Group's Deposit Account No. 50-1105, referencing billing number **VM 03-029 US**.

Respectfully submitted,

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